

**BEFORE  
THE PUBLIC SERVICE COMMIN OF  
SOUTH CAROLINA**

**DOCKET NO. 2011-271-E**

In the Matter of:	)	
	)	
Application of Duke Energy Carolinas,	)	<b>CORRECTED</b>
LLC for Authority to Adjust and Increase	)	<b>DIRECT TESTIMONY OF</b>
Its Electric Rates and Charges	)	<b>JIM L. STANLEY FOR</b>
	)	<b>DUKE ENERGY CAROLINAS, LLC</b>
	)	

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**I. INTRODUCTION AND PURPOSE**

1   **Q.    PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2    A.    My name is Jim L. Stanley. My business address is 526 South Church Street,  
3           Charlotte, North Carolina 28202.

4   **Q.    BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5    A.    I am Senior Vice President, Power Delivery for Duke Energy Corporation's  
6           Franchise Electric and Gas Business, including Duke Energy Carolinas, LLC  
7           ("Duke Energy Carolinas" or the "Company").

8   **Q.    PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS SENIOR VICE**  
9       **PRESIDENT, POWER DELIVERY FOR DUKE ENERGY CAROLINAS.**

10   A.    My duties and responsibilities include providing executive management of the  
11          electric transmission and distribution ("T&D") systems for Duke Energy's  
12          regulated utility operations in North Carolina, South Carolina, Indiana, Ohio, and  
13          Kentucky. With almost 5,000 employees and dozens of operating centers  
14          throughout the Company's five states, the Power Delivery organization tackles  
15          Duke Energy Carolinas' basic mission – reliably and safely keeping the power  
16          flowing to our customers.

17   **Q.    PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL**  
18       **QUALIFICATIONS.**

19   A.    I hold a Bachelor of Science degree in Accounting from Ball State University. I  
20          joined Duke Energy Indiana (f/k/a PSI Energy, Inc.) in June 1977 as a Staff  
21          Accountant/Corporate Accounting Analyst in the Accounting Department.

1       Thereafter, I progressed through several assignments of increasing responsibility  
2       in accounting, human resources, and field operations. In these functions, I served  
3       as both district and regional manager for field operations. Additionally, I have  
4       been the General Manager of employee and union relations, General Manager of  
5       T&D projects, and Vice President of T&D construction and maintenance. In  
6       November 2006, I was promoted to President of Duke Energy Indiana and held  
7       that position through May 2010, when I assumed my current role as Senior Vice  
8       President of Power Delivery. Both Power Delivery and the Customer Service  
9       organizations are part of the Company's franchise electric and gas business and  
10      are the primary functions that interface with Duke Energy Carolinas' customers  
11      on a daily basis.

12   **Q.   HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION**  
13   **OR ANY OTHER REGULATORY BODIES?**

14   A.   Yes. I testified on behalf of Duke Energy Indiana in support of energy efficiency  
15      and demand-side management programs in Indiana Cause No. 43374. I also  
16      testified in connection with Duke Energy Indiana's Smart Grid filing in Indiana  
17      Cause No. 43501 and storm restoration efforts in Indiana Cause No. 43743.

18   **Q.   HOW IS YOUR TESTIMONY ORGANIZED?**

19   A.   Aside from this introduction and a conclusion, my testimony is organized into  
20      three additional sections:

- 21      1) A description of Duke Energy Carolinas' Power Delivery system, noting the  
22          changes since the Company's last general rate case in Docket No. 2009-226-E  
23          ("the 2009 Rate Case");

- 1           2) An overview of the Power Delivery system's strong operational performance;  
2           and  
3           3) An explanation of the challenges the Company is facing and the need for  
4           continued investment in and modernization of the electric delivery systems in  
5           order to maintain system reliability and continue to meet the needs of the  
6           Company's customers.

7   **Q.   PLEASE PROVIDE AN OVERVIEW OF YOUR TESTIMONY.**

8   A.   Since the conclusion of the Company's last general rate case in 2009, the  
9       Company has added approximately \$1.1 billion in electric plant for T&D  
10      additions. The T&D capital additions are necessary to serve our new and existing  
11      customers. Moreover, the Company's T&D capital additions are consistent with  
12      our modernization program to provide reliable service by repairing, replacing and  
13      refurbishing our infrastructure, including many T&D assets and systems that are  
14      decades old and nearing the end of their useful lives. The revenue requirement  
15      for these capital additions and improvements is included in the revenue  
16      requirement presented by Witness Shrum.

17           In addition to capital expenditures, the Company has also faced increases  
18      in operations and maintenance ("O&M") costs related to Duke Energy Carolinas'  
19      on-going efforts to modernize and maintain its Power Delivery systems and  
20      improve its customer-focused operations. We have been able to manage O&M  
21      costs during 2010 ("the Test Period") and, as noted by Witness Heigel, we've  
22      been able to keep O&M costs in rates essentially flat since the 2009 Rate Case.

1 The Company, however, continues to face a variety of increasing pressures on  
2 capital and operating costs associated with many factors, including:

- 3 (1) intermittent renewable generation;
- 4 (2) more prescriptive reliability standards;
- 5 (3) higher maintenance on aging T&D assets; and
- 6 (4) continued costs of adding customers.

7 Additionally, we continue to investigate grid modernization technologies in the  
8 Upstate of South Carolina and at our McAlpine substation in Charlotte, North  
9 Carolina in order to develop a cost-effective utilization and deployment strategy.

10 We believe it is important to take a long-range view of the challenges we  
11 face. By doing so, we have been able to consistently improve our service and  
12 reliability while prudently serving our customers' needs as explained in detail in  
13 my testimony. Our reliability, combined with our investments in customer  
14 service functions, contributes greatly to our overall customer satisfaction. We  
15 believe that additions to our system will enable us to continue providing safe,  
16 reliable electric service at reasonable costs.

17 **II. DUKE ENERGY CAROLINAS' POWER DELIVERY**  
18 **SYSTEM**

19 **Q. PLEASE GENERALLY DESCRIBE DUKE ENERGY CAROLINAS'**  
20 **POWER DELIVERY SYSTEM.**

21 A. Duke Energy Carolinas' Power Delivery system delivers retail electric service to  
22 approximately 2.4 million customers located throughout a 24,000 square mile  
23 service area in western South Carolina and the central and western part of North

1 Carolina. Approximately 600,000 of the Company's retail customers are in South  
2 Carolina. In addition to its retail customers, Duke Energy Carolinas also sells  
3 electricity at wholesale rates to municipal, cooperative, and other investor-owned  
4 utilities.

5 Duke Energy Carolinas operates as a single control area to manage  
6 collectively and economically the Company's integrated electricity delivery  
7 systems in both South and North Carolina. This system interconnects with eight  
8 other electric utilities and includes a little more than 13,000 circuit miles of  
9 transmission lines. The distribution system is comprised of approximately 66,500  
10 miles of overhead distribution lines and almost 34,900 miles of underground  
11 distribution lines. Duke Energy Carolinas' Power Delivery system also includes  
12 174 transmission substations and 1,489 distribution and industrial substations with  
13 a combined capacity of approximately 88 million kVA. In addition to power lines  
14 and substations, Duke Energy Carolinas' Power Delivery system includes various  
15 other equipment and facilities such as control rooms, computers, poles,  
16 transformers, capacitors, street lights, meters, and protective relays. Together,  
17 these assets provide the Company considerable operational flexibility with its  
18 Power Delivery system and allow Duke Energy Carolinas to provide safe,  
19 reliable, and economical power to the Company's customers in South Carolina.

1   **Q.   MR. JAMIL TESTIFIES TO THE MODERNIZATION OF THE**  
2       **GENERATING FLEET. ARE SIMILAR EFFORTS UNDERWAY FOR**  
3       **THE COMPANY’S POWER DELIVERY SYSTEM?**

4   A.   Yes. Duke Energy Carolinas’ Power Delivery systems are upgraded on an  
5       ongoing basis through a variety of programs and projects. Based on Duke Energy  
6       Carolinas’ estimates of its T&D assets, the Company’s wooden poles, power  
7       transformers, substation breakers, and transmission line structures average  
8       approximately 30 to 40 years old. Through the Company’s inspection and  
9       maintenance programs, Duke Energy Carolinas regularly identifies system  
10      components that require replacement or refurbishment, including poles,  
11      transformers, circuit breakers, and conductors. Duke Energy Carolinas’  
12      inspection and maintenance programs include distribution line inspections to  
13      identify and replace wooden poles on a regular cycle, underground primary cable  
14      replacement where outage history and cable analysis predicts failures, transformer  
15      retrofits to extend operational life, upgrades to circuit breaker relays to  
16      significantly improve circuit reliability, and transmission line rebuilds to inspect  
17      and replace poles and other structures. The Company also upgrades existing  
18      equipment or installs new substations, transmission lines, and distribution lines as  
19      existing customers grow their load or new customers are added. Similarly,  
20      engineering standards are incorporated into new customer expansion and  
21      relocation projects by specifying construction techniques and equipment that will  
22      cost-effectively improve system performance.

1 **Q. HOW DO CUSTOMERS BENEFIT FROM THESE POWER DELIVERY-**  
2 **RELATED EFFORTS?**

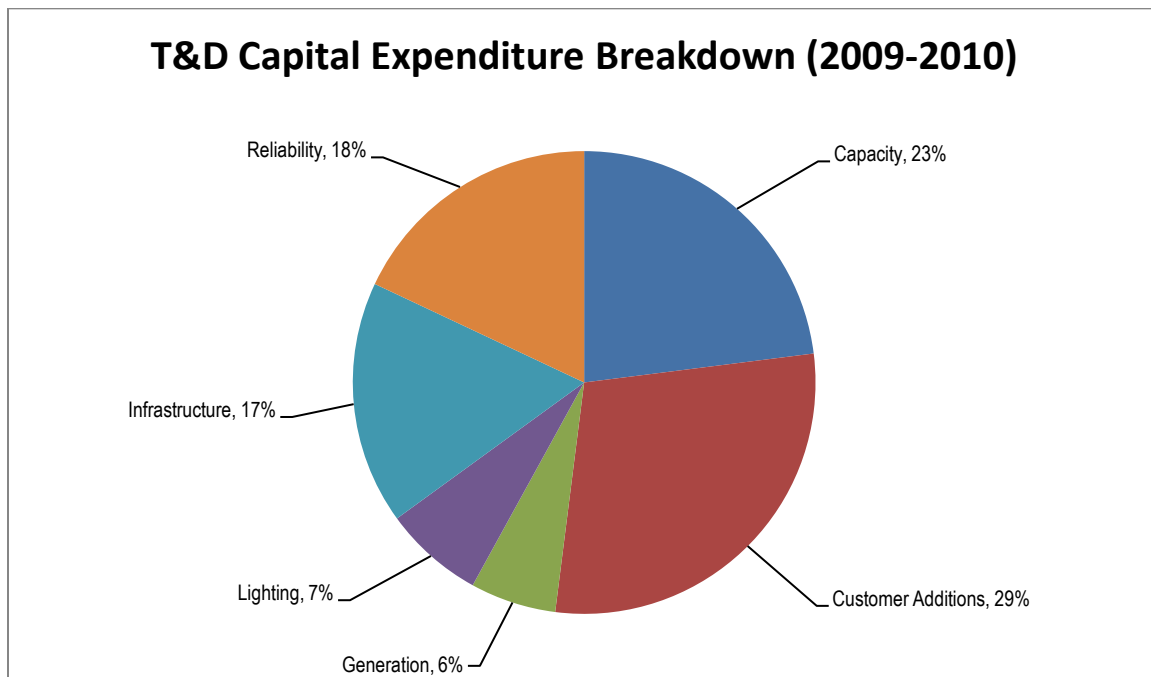
3 A. Duke Energy Carolinas' customers benefit from increased reliability, expansion  
4 of our electric system to meet the needs of new and existing customers, and  
5 improved power quality. The Company's T&D investments enhance the  
6 Company's ability to provide safe, reliable and low-cost electricity. Furthermore,  
7 they allow the addition of renewable generation to an already diverse portfolio of  
8 generation assets.

9 **Q. HAS DUKE ENERGY CAROLINAS' POWER DELIVERY SYSTEM**  
10 **GROWN SINCE THE COMPANY'S LAST GENERAL RATE CASE IN**  
11 **2009?**

12 A. Yes. Duke Energy Carolinas' South Carolina Power Delivery system has  
13 continued to expand since the 2009 Rate Case due to connecting additional  
14 customers and ongoing modernization efforts. Despite the current economy,  
15 customers have continued to move in and out of the Company's service territory.  
16 In fact, Duke Energy Carolinas has added over 60,000 new retail customers in the  
17 last two years. Typically new customers locate in areas where Duke Energy  
18 Carolinas has to build new T&D facilities to serve them. At the generation level,  
19 load may not change due to the net impact of both entering and exiting customers.  
20 However, T&D is different than generation. Because T&D is more  
21 geographically sensitive, the Company may have to build new facilities to serve  
22 new or relocating customers.



1                   From January 1, 2010 through December 31, 2010, Duke Energy  
2 Carolinas added 14 substations to increase the overall capacity of the system and  
3 installed over 900 circuit-miles of distribution circuits. From the conclusion of  
4 the 2009 Rate Case through the conclusion of this case, we will have added  
5 approximately \$801 million for distribution and \$230 million for transmission to  
6 electric plant in service. The chart below shows the major categories of T&D  
7 capital expenditures made during 2009 and 2010. This breakdown also reflects  
8 the major categories of T&D capital expenditures included in the T&D additions  
9 since the 2009 Rate Case.



10                   As this chart indicates, approximately 60% of the Company's T&D investment is

1 related to new customers, lighting and capacity. The remaining expenditures  
2 include our ongoing work on infrastructure and reliability improvements such as  
3 pole equipment replacement, circuit sectionalization and other equipment  
4 installations to improve performance.

5 **Q. IS THE COMPANY PROPOSING TO INCLUDE CWIP RELATED TO**  
6 **TRANSMISSION AND DISTRIBUTION IN RATE BASE?**

7 A. Yes. As provided in the testimony of Witness Shrum, as of October 31, 2011, the  
8 company projects that it will have recorded a total of \$164<sup>1</sup> million in Constuction  
9 Work In Progress (“CWIP”) related to Transmission and Distribution  
10 investments. The South Carolina retail share of that is projected to be \$36  
11 million.

12 **Q. IN YOUR OPINION, ARE ALL OF THE POWER DELIVERY**  
13 **FACILITIES INCLUDED IN THE COMPANY’S REQUEST USED AND**  
14 **USEFUL IN PROVIDING SERVICE TO DUKE ENERGY CAROLINAS’**  
15 **RETAIL ELECTRIC CUSTOMERS IN SOUTH CAROLINA?**

16 A. Yes. Including the projects that will close to service during the pendency of this  
17 case, the T&D system is used and useful to provide safe, reliable, efficient and  
18 economical electricity to the Company’s 2.4 million customers in South Carolina  
19 and North Carolina.

20 **III. OPERATIONAL PERFORMANCE**

21 **Q. WHAT ARE DUKE ENERGY CAROLINAS’ GOALS WITH RESPECT**  
22 **TO OPERATIONAL PERFORMANCE AND CUSTOMER**

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<sup>1</sup> On a total system basis, including AFUDC.

1           **SATISFACTION?**

2       A.     Duke Energy Carolinas' goal is to deliver dependable, reliable, safe, and efficient  
3           electric utility service at reasonable prices. The Company's on-going challenge is  
4           to be a leader in electric utility operational performance, measured in terms of  
5           customer satisfaction and the safety and reliability of the Company's Power  
6           Delivery system, while managing operational and capital investment costs for the  
7           benefit of our customers.

8       **Q.     PLEASE EXPLAIN THE METRICS THE COMPANY USES TO**  
9           **MEASURE THE EFFECTIVENESS OF ITS POWER DELIVERY**  
10          **OPERATIONS.**

11      A.     Duke Energy Carolinas utilizes several industry standard metrics to assess the  
12           overall effectiveness of its Power Delivery and customer service operations.  
13           These metrics include reliability indices, to measure the performance of the Power  
14           Delivery system, and customer satisfaction scores to determine how well the  
15           Company is meeting its customers' needs.

16               The Company has surveyed its customers to determine how to prioritize  
17           reliability activities. In these interviews, customers cite a strong preference for  
18           eliminating outages instead of reducing outage duration. Thus, the Company's  
19           reliability-related activities primarily emphasize minimizing the number of  
20           outages. We remain committed to the timely and safe restoration of power when  
21           outages do occur, tracking outage duration and looking for opportunities to reduce  
22           their length. In addition to outage frequency and length, the Company also works  
23           to reduce other power quality issues that may arise. Duke Energy Carolinas uses

1 customer satisfaction metrics to ensure reliability and power quality investments  
2 are meeting customer expectations, to improve the Company's customer  
3 interactions, and to identify where we may offer additional value-added services.  
4 These metrics and the Company's customer-related activities are discussed in  
5 more detail in Witness Heigel's testimony.

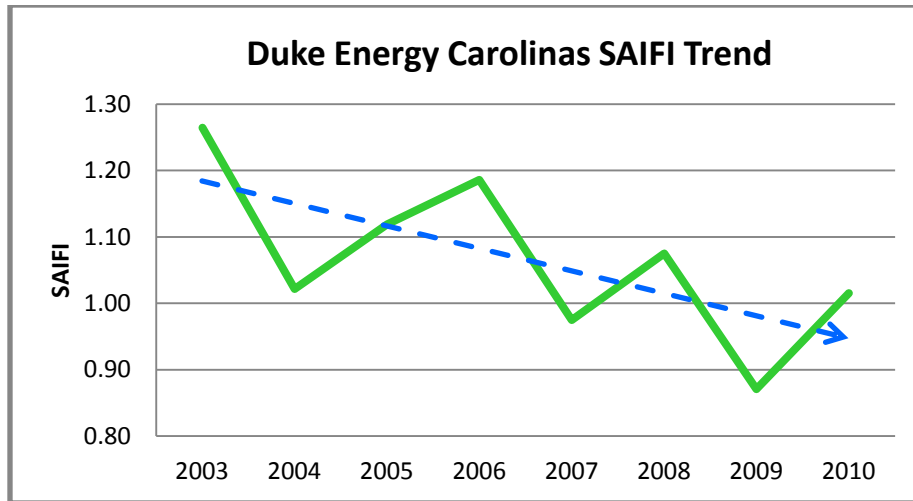
6 The Company uses industry-accepted Power Delivery performance  
7 metrics, two of which are defined below:

8 • **System Average Interruption Frequency Index ("SAIFI")** is a ratio that  
9 shows the average number of interruptions greater than five minutes in length  
10 per customer during the course of a year.

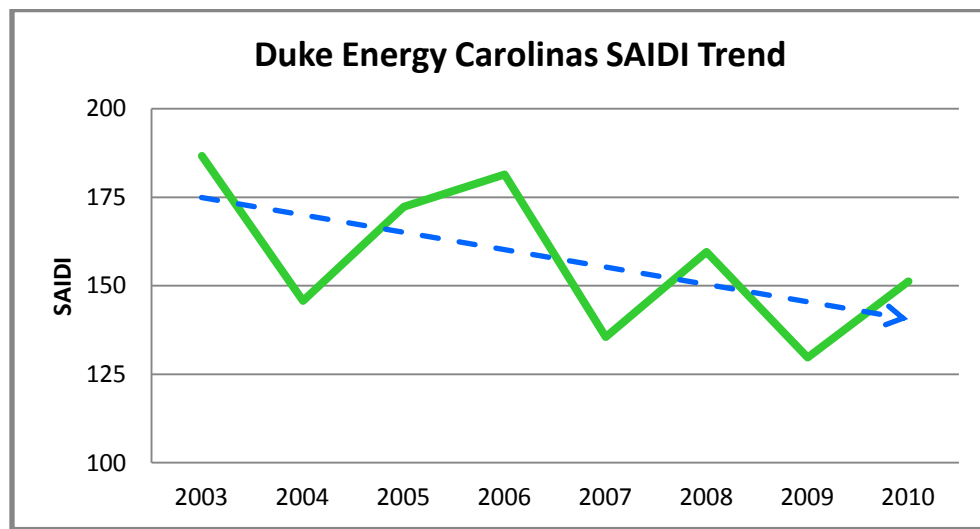
11 • **System Average Interruption Duration Index ("SAIDI")** is the average  
12 number of minutes each customer is interrupted per year, and is expressed by  
13 the sum of customer interruption durations divided by the total number of  
14 customers served.

15 **Q. HOW HAS DUKE ENERGY CAROLINAS' SYSTEM PERFORMED**  
16 **UNDER THESE METRICS?**

17 A. The results associated with the Company's SAIFI and SAIDI scores typically  
18 follow a saw-tooth pattern due to variances in the weather experienced from year  
19 to year. The overall trend of these scores, however, shows a steady improvement  
20 in the Company's performance. The results from 2010 follow this same pattern  
21 due to extreme weather experienced by the Company during last year's summer  
22 and winter months. Yet, the overall trend of Duke Energy Carolinas' results  
23 continues to improve, as shown from the downward direction in the graphs below:



**Figure 1 - Duke Energy Carolinas' Historic System Average Interruption Frequency Index (SAIFI)**



**Figure 2 - Duke Energy Carolinas' Historic System Average Interruption Duration Index (SAIDI)**

1 **Q. PLEASE DESCRIBE DUKE ENERGY CAROLINAS' INVESTMENTS**  
2 **MADE FOR RELIABILITY.**

3 A. As discussed earlier in my testimony, Duke Energy Carolinas dedicated  
4 approximately 18% of its annual T&D capital expenditures in 2009 and 2010, to  
5 making reliability improvements to the system. The Company has many proactive  
6 programs for continuous improvement in reliability, including the following:

- 7 • Sectionalization – Installation of automatic devices to limit the number  
8 of customers impacted by individual outage events.
- 9 • Distribution Automation – Addition of switching devices that can  
10 automatically isolate outages and restore power to the unaffected  
11 customers by switching them to different circuits.
- 12 • Substation control relays – Replacement of older, limited functionality,  
13 electro-mechanical and first generation microprocessor relays on  
14 distribution circuit breakers, with newer microprocessor relays that  
15 have enhanced capabilities. This allows for more precise control of  
16 the equipment and remote access to data to help in finding outage  
17 locations.
- 18 • Substation Animal Fences – Installation of electrical fence (inside the  
19 existing perimeter fence) at substations with frequent animal-caused  
20 outages.
- 21 • Transmission Line Equipment – Improvement of transmission line  
22 reliability by adding arrestors and overhead ground-wire at strategic  
23 locations.

- 1       • Declared Circuits – For major feeders, where normal programs have  
2       not achieved the desired results, special teams are assigned to make  
3       detailed assessments and corrections.
- 4       • Fuse Replacements – Fuses which were installed in certain vintage  
5       years and are identified to be a source of outages through analysis of  
6       outage data are replaced.
- 7       • Deteriorated Conductor – Replacement of select copper and other  
8       primary conductors where the conductor strength has been damaged  
9       due to heating and is at risk of breaking.
- 10      • Distribution Line Infrared Circuit Backbones – Infrared cameras are  
11      used to identify hot spots, indicating poor or loose connections. These  
12      connections are repaired as discovered.
- 13      • Transformer Retrofit – Installation of fuse protection on overhead  
14      transformers to limit the number of customers affected by a possible  
15      transformer failure.

16   Q.   **DO THE COMPANY'S T&D CAPITAL EXPENDITURES ALSO**  
17       **INCLUDE CAPITAL MAINTENANCE PROGRAMS?**

18   A.   Yes. In addition to making strategic investments that are specifically targeted at  
19       reliability, the Company spent 17% of its T&D capital expenditures on planned  
20       and unplanned infrastructure maintenance activities in 2009 and 2010, including  
21       the Company's efforts to regularly identify system components that are nearing  
22       the end of their life and making repairs or replacements necessary to ensure the  
23       integrity of the system. Capital maintenance spending also includes amounts

1 associated with the replacement of capital units of property during routine outage  
2 events, relocations of lines to accommodate highway projects, and compliance  
3 activities such as new over-duty breaker installations.

4 **Q. WHAT ARE DUKE ENERGY CAROLINAS' PROJECTED CAPITAL**  
5 **INVESTMENTS RELATING TO ITS T&D FACILITIES?**

6 A. Due to the Company's on-going efforts to expand the system, modernize aging  
7 infrastructure, and in light of the other challenges I describe more fully in my  
8 testimony below, the Company's financial plans include investments of  
9 approximately \$2 billion in its Power Delivery system for calendar years 2011  
10 through 2013.

11 **IV. OUTLOOK FOR DUKE ENERGY CAROLINAS'**  
12 **POWER DELIVERY SYSTEM**

13 **Q. PLEASE PROVIDE YOUR OUTLOOK FOR DUKE ENERGY**  
14 **CAROLINAS' POWER DELIVERY SYSTEM.**

15 A. The Company's Power Delivery system is facing three primary challenges to  
16 continue to safely and reliably deliver cost-effective energy to its customers.  
17 These challenges include: (1) managing and modernizing an aging infrastructure  
18 to maintain service quality, handling additional customers and higher power  
19 quality needs, (2) strategically investing and preparing for digitally-  
20 interconnected grid modernization technologies that will further improve our  
21 operations but test the way we currently manage and deliver power to customers;  
22 and (3) responding to changing reliability standards that necessitate additional  
23 capital investments.



1 As discussed above, new customers frequently require installation of  
2 additional T&D infrastructure while existing customers require the T&D assets  
3 used to serve them remain operational. We must modernize existing assets and  
4 install new systems to replace and expand T&D equipment in order to ensure the  
5 level of reliability the Company's retail customers have come to expect. In  
6 addition, customers are also increasingly using electric-intensive equipment that is  
7 highly sensitive to power quality, prompting demands for highly-reliable electric  
8 service that minimizes the number of voltage fluctuations. Finally, Duke Energy  
9 Carolinas must also ensure the Company's T&D systems are sufficiently robust to  
10 facilitate economic power deliveries from off-system energy purchases.  
11 Together, the challenges of connecting additional customers and providing  
12 higher-quality electric service compound the need to modernize and upgrade  
13 existing infrastructure in order to economically meet the needs of the Company's  
14 customers.

15 **Q. WHAT STEPS HAS DUKE ENERGY CAROLINAS TAKEN TO**  
16 **EXPLORE GRID MODERNIZATION TECHNOLOGY?**

17 A. In addition to managing growth and improving system reliability, the Company  
18 will need to make specific investments to improve system performance by  
19 replacing old technology that was designed to deliver electricity in an analog  
20 world. Digital, two-way communications, interconnected sensing, monitoring,  
21 and control equipment can provide a wide variety of benefits to both customers  
22 and the Company's operations. These technologies can enhance the reliability of  
23 the system, improve power quality, enable the next generation of energy

1 efficiency programs, integrate and manage distributed and renewable resources,  
2 and improve system operations through distribution automation-related  
3 improvements. New digital technologies can also support the communication  
4 platform, data collection, and analysis necessary to troubleshoot and improve grid  
5 functionality. Although the Company has been deploying some advanced  
6 technologies, a modernized digital grid overlays a communication network to  
7 interface with these devices and provides a much more efficient system. Thus,  
8 these new technologies represent the next step in the modernization of the grid.

9           Since 2006, Duke Energy Carolinas has been examining an array of new,  
10 more advanced technologies, such as new substation circuit breakers, electronic  
11 reclosers in high customer density areas, relay replacements, new capacitor  
12 controls, line sensors, and backhaul communications to substations. More  
13 recently, Duke Energy Carolinas began field testing modernized equipment to  
14 better understand how these new technologies interact with the Company's  
15 existing electric grid in both South Carolina and North Carolina to (1) improve  
16 system reliability by reducing outages and outage duration; (2) improve power  
17 quality through voltage optimization; (3) enhance operational efficiencies through  
18 distribution automation; (4) improve system performance through more detailed  
19 and more timely data collection; (5) decrease power consumption by controlling  
20 voltage more efficiently; (6) develop a comprehensive communications  
21 architecture capable of handling increased data use and collection; and (7) provide  
22 a platform for offering customers value-added new or enhanced products and  
23 services to assist with managing their energy consumption.

1           The Company has a test site located in Marietta, South Carolina, which  
2 focuses on the viability and robustness of differing communications technologies  
3 in rural applications. The Company installed smart meters and communications  
4 devices called “nodes” in an area that allowed the Company to test the ability of  
5 this equipment to function near mountaineous terrain. The meters communicate  
6 with the nodes via power line carrier technology, and in turn, the nodes use  
7 wireless cellular service to provide two-way communication with the Company’s  
8 system for gathering meter information. The Company will use the results from  
9 projects such as this to develop an optimal and cost-effective grid modernization  
10 utilization and deployment strategy for the Carolinas.

11           Another example of our grid modernization efforts includes our work with  
12 Furman University. The Company supported Furman’s Sustainable Home project  
13 at the Duke Energy Village in Greenville, South Carolina. The project involved  
14 Cliffs Cottage, an ultra-energy-efficient house, which provided insight into what  
15 the future holds for applying green technologies to residential use. At the end of  
16 the project, Furman University converted Cliffs Cottage to a small conference  
17 facility which continues to use these green technologies.

18           As part of our grid modernization program, the Department of Energy  
19 (“DOE”) awarded the Company grants. Duke Energy Corporation received \$200  
20 million for grid modernization deployments, \$4 million for a transmission project,  
21 \$21.8 million for grid modernization demonstration projects, and \$3.4 million for  
22 workforce development. Notice of these awards was issued in May of 2010.  
23 Based upon execution of the plan provided by the DOE, the \$4 million

1 transmission project as well as a portion of the \$200 million grant will be  
2 allocated to Duke Energy Carolinas, depending upon the timing of the Company's  
3 expenditures and deployment for the infrastructure components.

4 **Q. HOW ARE INDUSTRY STANDARDS CHANGING AND WHAT ARE**  
5 **THE IMPACTS TO THE COMPANY?**

6 A. Duke Energy Carolinas must manage the impacts from a wide variety of  
7 mandatory reliability standards. The Energy Policy Act of 2005 ("EPAct 2005")  
8 added Section 215 to the Federal Power Act ("FPA") directing the Federal Energy  
9 Regulatory Commission ("FERC") to certify an Electric Reliability Organization  
10 ("ERO") to oversee the reliability of the U.S. portion of the North American bulk-  
11 power system. It also gave FERC the authority to approve reliability standards  
12 and assess penalties on users, owners, and operators of the bulk-power system that  
13 are not in compliance with these reliability standards. Under the EPAct 2005,  
14 compliance with reliability standards by industry participants is mandatory. A  
15 company can be sanctioned for violations of these standards. These sanctions can  
16 include significant monetary penalties of up to \$1 million per day per violation.

17 The North American Electric Reliability Corporation ("NERC") is the  
18 ERO certified by the FERC to establish and enforce reliability standards for the  
19 bulk transmission system. These reliability standards address various aspects of  
20 the planning and operating activities of the bulk-power system, including real-  
21 time transmission operations, balancing load and generation, and emergency  
22 restoration. There are 14 general subject matter categories of NERC reliability  
23 standards. Within these categories there are 120 FERC-approved reliability

1 standards. Additionally, there are 10 draft standards being reviewed by industry  
2 participants and 22 NERC Standards Committees developing additional  
3 standards.

4 **Q. PLEASE EXPLAIN THE NORTH AMERICAN ELECTRIC**  
5 **RELIABILITY CORPORATION'S CRITICAL INFRASTRUCTURE**  
6 **PROTECTION STANDARDS.**

7 A. The NERC Critical Infrastructure Protection ("CIP") standards are a subset of the  
8 NERC reliability standards, and they require utilities to protect certain critical  
9 infrastructure information technology assets from potential physical and cyber  
10 threats. The CIP standards mandate the development of a risk-based security  
11 policy based upon each company's specific assets, architecture, and exposure.  
12 Since 2006, Duke Energy Carolinas has aggressively worked to implement each  
13 version of the CIP standards. The Company utilizes a defense-in-depth approach  
14 to protect its cyber assets whereby the most critical assets are isolated both  
15 electronically (multiple firewalls, anti-virus, individual user accounts, etc.) and  
16 physically (accessible with approved badge access only).

17 Version 4 of the CIP is currently awaiting approval at FERC. Once  
18 approved, the Company will have two years to achieve compliance. Each version  
19 of the CIP standards greatly increases the number of facilities that are in scope,  
20 with the expectation that the standards will eventually include essentially all  
21 transmission substations and other sites greater than 100 kV.

22 Because these NERC CIP standards are mandatory, Duke Energy  
23 Carolinas has initiated numerous activities to insure that the Company's

1 operations are in compliance. While improving the security of certain critical  
2 assets, these activities have also led to increased resource needs.

3 **Q. ARE THERE OTHER SPECIFIC EXAMPLES OF RELIABILITY**  
4 **STANDARD CHANGES THAT ARE INCREASING THE COST OF**  
5 **PROVIDING SERVICE TO CUSTOMERS?**

6 A. Yes. The NERC Standard FAC-003-1 is intended to improve reliability by  
7 preventing outages from vegetation inside the transmission rights-of-way,  
8 minimizing outages from vegetation outside the rights-of-way, maintaining  
9 certain clearances between transmission lines and vegetation, and reporting  
10 vegetation related outages of the transmission system. To ensure compliance with  
11 the FAC-003-1 standard, Duke Energy Carolinas has increased spending on bulk  
12 system vegetation management programs.

13 NERC and other regional entities (e.g. SERC) became aware of  
14 discrepancies between the design and actual field conditions of transmission  
15 facilities, including transmission conductors. They felt these discrepancies could  
16 be both significant and widespread, with the potential to result in lowering line  
17 ratings. In October of 2010, NERC issued an alert, requiring verification of  
18 current facilities ratings based on actual field conditions. As a result, the  
19 Company will need to do a physical survey of the bulk transmission system with  
20 completion of high-priority lines by December 2011, medium-priority lines by  
21 2012, and low-priority lines by 2013. Remediation of any discrepancies  
22 discovered must be completed within one year of discovery. Duke Energy

1 Carolinas is forecasted to spend an estimated \$30 million (a combination of O&M  
2 and capital) to comply with this alert.

3 **Q. WHAT IMPACTS COULD THE INTERPRETATION AND**  
4 **APPLICATION OF THE MANDATORY RELIABILITY STANDARDS**  
5 **HAVE ON T&D OPERATIONS?**

6 A. Duke Energy Carolinas seeks to appropriately balance reliability, affordability,  
7 and environmental stewardship in its operation of its system. As demonstrated  
8 above, the Company is already experiencing higher costs, which will grow in  
9 magnitude in future periods, as a result of federally mandated reliability  
10 standards. The Company is concerned about not only the growth in the number of  
11 these standards but their interpretation. If these standards are interpreted such that  
12 any reportable event, even where there is no impact on customers, generators, or  
13 the bulk transmission system, is deemed to be a violation resulting in penalties,  
14 Duke Energy Carolinas will be required to spend substantial additional funds to  
15 bring equipment and processes into compliance even though it creates little  
16 incremental improvement in reliability. If FERC's enforcement policy continues  
17 to develop such that there is an absence of meaningful cost-benefit analysis to  
18 enforcement decisions, the potential exists for increased costs to consumers  
19 without a corresponding boost in reliability. The Company is hopeful that as the  
20 entire industry gains more experience with reliability enforcement, those tasked  
21 with ensuring reliability compliance will balance the understandable concern  
22 about enforcement with recognition of the Company's fundamental operational  
23 goal of providing safe, reliable service at a reasonable cost.

1 **VI. CONCLUSION**

2 **Q. IS THERE ANYTHING YOU WOULD LIKE TO SAY IN CONCLUSION?**

3 A. Yes. Duke Energy Carolinas has managed its Power Delivery costs effectively,  
4 expanded its Power Delivery system with prudent capital investments, and  
5 provided strong operational results. In order to continue providing safe, reliable,  
6 and economically-priced electricity to our customers while modernizing and  
7 expanding the infrastructure necessary to provide the energy for South Carolina's  
8 future growth, the Company must continue to invest in T&D operations.

9 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

10 A. Yes.